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pressure

JOFRA™

Handheld Pressure Calibrator
Model HPC400

Pressure ranges

HPC400-2C	Vacuum to 2 bar / 30 psi
HPC400-7C	Vacuum to 7 bar / 100 psi
HPC400-20C	Vacuum to 20 bar / 290 psi

Transmitter loop features

Transmitter loop measurement, 24 volt DC loop supply and HART® resistor.

Easy pressure switch test

Opening and closing pressures are automatically recorded and deadband is calculated. All is presented in a large graphical display.

Useful set of features

The HPC400 offers a selection of useful features: voltage measurement, high speed minimum/maximum hold, 5 user specified setups, high or low resolution, and damped readout for fluctuating pressures.

Ready-to-use systems

The HPC400 is available as a complete system or as an independent instrument. The systems are ready for use, complete with calibration pump, hose, fittings and a convenient hard case to store the complete system.

The HPC400 series is a true calibrator, a field instrument designed for easy and reliable check and calibration of pressure. Use the HPC400 series in process control applications such as verification or calibration of pressure gauges, transducers, transmitters, pressure switches, and safety valves.

The HPC400 series is recognized for its high quality and carefully selected time-saving features making calibration tasks easy to perform. All relevant information is shown in the large multi information display at once, such as: 15 different pressure units, transmitter mA reading, min/max recording, peak reading, and semiautomatic pressure switch test finding the closing, opening and hysteresis pressure (deadband), and 5 user specified setups for frequent measurement/calibration jobs.

Maintenance of the instrument is easy. Recalibration of the unit can be performed locally with an accurate pressure reference: No need to send the unit back to the manufacturer for recalibration. For all systems, pump and calibrator are separate so replacement of the pump does not require return of the complete system for repair.

The HPC can be delivered as an individual calibrator or as a complete calibration system ready for use in a carrying case, including pump, hose, connectors, battery, test leads, user manual, and traceable calibration certificate.

ISO 9001 Manufacturer

Specification Sheet
SS-HPC400

AMETEK®
CALIBRATION INSTRUMENTS

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Clear graphical display
Large backlight graphics display the pressure. Icons show current status and mode, 1, 2 or 3 measurement windows, to suit your applications and demands.

Intuitive menu system
Combination of “soft keys” and cursor keypad ensures an easy operation.

Useful set of features
Perform semi-automatic pressure switch tests. switch in HART resistor or other calibration tasks, assisted by the outstanding functions and features of the HPC400.

Electrical connections
HPC calibrators are well equipped and include inputs for mA, voltage, switches and temperature measurements, including 24 VDC supply for mA transmitters.

Units
15 different pressure engineering units.
Serial interface Connection for JOFRA APM pressure module and for computer.

Zero
To keep high accuracy, a dedicated zero button is available to provide convenient zero before test.

ON / OFF
Auto shut-off to expand battery life time (user programmable).

Pressure connections
1/8” BSP female. 300 series stainless steel.
1/4” NPT male and 1/4” BSP female adapters are supplied as standard.

FUNCTIONAL SPECIFICATIONS

Pressure; gauge / compound ranges

bar ..... vacuum to 2, 7 & 20
psi ..... vacuum to 15, 30, 100 & 290

Engineering units (built-in)

User selectable ..... 15 units
(bar, mbar, MPa, kPa, inHg@0°C, mmHg@0°C, kg/cm^2, mmH$_2$O@4°C, mmH$_2$O@20°C, psi, inH$_2$O@4°C, inH$_2$O@20°C, inH$_2$O@60°F, cmH$_2$O@4°C, cmH$_2$O@20°C)

Pressure accuracy ambient temp. (18 to 28°C / 65 to 82°F)

All pressure ranges ..... ±0.05% F.S.
Vacuum ..... ±0.10% F.S.
F.S. (full scale) is the numerical value of the positive pressure range.
Temperature effect outside 18 to 28°C / 65 to 82°F ±0.005% F.S./°C

Display

LCD ..... Graphical (with light)
Display resolution ..... 5 digits
Display update ..... 3 times per second

Input / output (18 to 28°C / 65 to 82°F)

mA range ..... 0 to 24 mA
mA accuracy ..... ±0.015% RDG + 2 µA
Transmitter supply ..... 24 VDC ±10%
Voltage measurement ..... 0 to 30 VDC
Voltage accuracy ..... ±0.015% RDG + 2µV
HART® resistor ..... 250 Ω
Peak hold capture ..... 50 milliseconds
Switch test input ..... 5V (<1mA)
Temperature effect outside 18 to 28°C / 65 to 82°F ±0.001% F.S./°C.

Media compatibility

Nickel plated brass and 316 stainless steel

Environmental

Operating temperature ..... -10 to 50°C / 14 to 122°F
Storage temperature ..... -20 to 60°C / -4 to 140°F
Ingress protection rating IP54

Pressure connection

All calibrators ..... 1/8" BSP female
Adapters to 1/4" NPT male and 1/4" BSP female are included as standard.

Pressure overload

Overload alarm ..... "OL" in display at approx. +20% F.S.

Power supply

Battery ..... 4 x 1.5 VDC Alkaline
Battery type ..... AA, LR6, MN1500, AM3
Battery lifetime ..... Typically more than 35 hours
Low battery calibrator ..... Yes

Instrument dimensions (LxWxH)

Calibrator ..... 201x99x50 mm / 8.3x3.9x2.0 in
HPC400 weight (incl. battery) ..... 635 g / 22.4 oz
Calibrator, shipping ..... 243x180x80 mm/ 9.6x7.1x3.1 in
Calibrator weight, shipping ..... 1.1 kg / 39.5 oz

Miscellaneous

Compliance: EN 61326 : 2006 & CISPR 11, Edition 5.0 - 2009 Class "B"

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Function / Feature	HPC400
Single sensor high accuracy pressure calibrator	Yes
mA measurement	Yes
Voltage measurement	Yes
24 VDC transmitter supply	Yes
High speed pressure switch test	Yes
High speed min./max. hold	Yes
Display contrast adjustment	Yes
Instrument setup lock	Yes
Storage of 5 setups	Yes
Setup of automatic off timer	Yes
Setup of number of display windows / measurement channels	Yes
Select display high or low resolution	Yes
Setup of backlight timer	Yes
HART resistor on/off	Yes
Normal or damped display update rate	Yes

HPC400 PRESSURE RANGES

This table shows the resolutions that can be obtained by the HPC calibrators throughout all engineering units.

HPC400 Ranges and Resolutions			
Range (bar)	2	7	20
Burst pressure (bar)	20	70	133
Proof pressure (bar)	4	14	40
Range (psi)	30	100	300
Burst pressure (psi)	300	1000	2000
Proof pressure (psi)	60	200	600
Static pressure (psi)	n/a	n/a	n/a
psi	30.000	100.00	300.00
bar	2.0684	6.8947	20.684
mbar	2068.4	6894.8	20684
kPa	206.84	689.48	2068.4
MPa	0.2068	0.6894	2.0684
kg/cm^2	2.1092	7.0307	21.092
cmH_2O@4°C	2109.3	7030.9	21093
cmH_2O@20°C	2113.0	7043.4	21130
mmH_2O@4°C	21093	70309	n/a
mmH_2O@20°C	21130	70434	n/a
inH_2O@4°C	830.42	2768.1	8304.2
inH_2O@20°C	831.89	2773.0	8318.9
inH_2O@60°F	831.23	2770.8	83123
mmHg@0°C	1551.5	5171.5	15515
inHg@0°C	61.081	203.6	610.81

Proof pressure - maximum allowable pressure without a shift in calibration.
Burst pressure - sensor damaged or destroyed, some risk of personal injury.

STANDARD DELIVERY (HPC Calibrator)

- HPC400 calibrator
- Traceable calibration certificate (NIST) with pressure and vacuum performance
- 4 x 1.5 volt batteries
- Adapter to 1/4” NPT male from 1/8” BSP male
- Adapter to 1/4” BSP female from 1/8” BSP male
- 1/8” sealed gasket / washer type
- Test leads: red and black
- Hand strap with clip
- User manual

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HPC400, System A

- **AXX/0 to 2 bar (0 to 30 psi)**
- **AHX/0 to 20 bar (0 to 290 psi)**

This system includes the HPC calibrator together with one pneumatic hand pump: T-960 and T-970, depending on the chosen pressure range. System A is an easy-to-use single hand operated calibration system. No need for a flat surface to operate the system - just hold it in your hand.

The system comes in a carrying case with cut-outs for fittings, hose, and the complete assembled calibration unit - no time is required to assemble the unit. The calibrator can at any time be used separately for other pressure test jobs.

A special quick connector between the pump and the calibrator makes it possible to separate the system in seconds and swivel the calibrator for easy viewing.

The HPC calibrators used in System A are delivered calibrated in both pressure and vacuum.

T-960 and T-970 pumps for system A

Model T-960 pneumatic pressure pump features an extended range volume adjuster for precise control of the pump pressure and a comfortable pistol grip handle.

Model T-970 pneumatic pressure pump is similar to the T-960, but generates pressures up to 20 bar (290 psi).

Pressure range, T-960..... 0 to 2 bar / 0 to 30 psi
Pressure range, T-970.....0 to 20 bar / 0 to 290 psi
Type..... Pneumatic
Test medium.....Air
Operation..... Scissor
“O”-rings .....Buna-N
Wetted parts.....Aluminum, brass, stainless steel, nylon, Nylatron GS
Connection to test object.....Hose 0.6 m/24 in with 1/4” BSP and NPT female terminations
Size..... 21.6x12.1x6.2 cm / 8.5x4.8x2.4 in
Weight .....1.4 kg / 3.0 lb

Included with System A delivery

- HPC standard delivery (see page 5)
- Hand pump T-960 or T-970 with a 0.6 m / 24 in hose with 1/4” BSP and NPT female terminations
- 3/8” BSP female adapter with 1/4” BSP and NPT female terminations
- Quick connector between pump and HPC calibrator
- 1 roll of Teflon tape
- Protective carrying case

Accessories

- Pressure hose for T-960/970, 0.5 meter
- Pressure hose for T-960/970, 1.0 meter
- Pressure hose for T-960/970, 2.0 meter
- Pressure hose for T-960/970, 5.0 meter
- Set of BSP female fittings, Teflon tape, packings
  * Fitting size : 1x1/8”, 1x3/8”, 1x1/2”
- Set of NPT female fittings, Teflon tape, packings
  * Fitting size : 1x1/8”, 1x1/4”, 1x3/8” 1x1/2”
- Connections for APM H/S pressure modules
- Fitting 1/8” NPT male to 1/4” NPT male for APM-H pressure module
- Fitting 1/4” NPT male to 1/4” NPT male for APM-S pressure module

HPC500, System B

- **BXX/Vacuum to 2 bar (30 psi)**
- **BHX/Vacuum to 20 bar (290 psi)**

This system includes the dual function pneumatic hand pump. With this pump you can calibrate both vacuum and pressure applications. It takes just a few seconds to switch between vacuum and pressure, just push one button (valve) on the hand pump.

The System B comes in a carrying case with cut-outs for fittings, hose and the complete assembled calibration unit - no time required to assemble the unit before use.

The calibrator and the pump are fitted with a special quick connector that makes it possible to separate the system in seconds without any tool. This quick connector also makes it possible to use the assembled system with the calibrator twisted to any angle.

T-965 and T-975 hand pumps for system B

Model T-965 and T-975 pneumatic pressure pumps feature both vacuum and pressure generation. Quick switch (valve) makes it easy to switch from vacuum to pressure measurement. A built-in release valve, a volume adjuster for fine adjustment and a dual pressure output enable a safe and simple operation. The unit offers both metric and imperial threads on the reference connection and the hose.

Pressure range, T-965.....vacuum to 2 bar (30 psi)
Pressure range, T-975.....vacuum to 20 bar (290 psi)
Type..... Pneumatic
Test medium.....Air
Operation..... Scissor
“O”-rings .....Buna-N
Wetted parts.....Aluminum, brass, stainless steel, nylon, Nylatron GS
Connection to test object.....Hose 0.6 m/24 in with 1/4” BSP and NPT female terminations
Size..... 21.6x12.1x6.2 cm / 8.5x4.8x2.4 in
Weight .....1.4 kg / 3.0 lb

Included with System B delivery

- HPC standard delivery (see page 5)
- Hand pump T-965 or T-975 with a 0.6 m / 24 in hose with 1/4” BSP and NPT female terminations
- 3/8” BSP female adapter with 1/4” BSP and NPT female terminations
- Quick connector between pump and HPC calibrator
- 1 roll of Teflon tape
- Protective carrying case

Accessories

- Pressure hose for T-975, 0.5 meter
- Pressure hose for T-975, 1.0 meter
- Pressure hose for T-975, 2.0 meter
- Pressure hose for T-975, 5.0 meter
- Set of BSP female fittings, Teflon tape, packings
  * Fitting size : 1x1/8”, 1x3/8”, 1x1/2”
- Set of NPT female fittings, Teflon tape, packings
  * Fitting size : 1x1/8”, 1x1/4”, 1x3/8” 1x1/2”
- Connections for APM H/S pressure modules
- Fitting 1/8” NPT male to 1/4” NPT male for APM-H pressure module
- Fitting 1/4” NPT male to 1/4” NPT male for APM-S pressure module

ORDERING INFORMATION

Order number						Description
HPC						Type
	400					Model
	NONE					No calibrator, pressure system only
						Pressure range
		002C				Vacuum to 2 bar / 30 psi gauge/compound
		007C				Vacuum to 7 bar / 100 psi gauge/compound
		020C				Vacuum to 20 bar / 290 psi gauge/compound
						Calibration certificate
			G			NIST traceable calibration certificate
						Accessories (Optional)
				B		Rechargeable battery pack
				C		Soft case
						Pressure system
					IND	Calibrator only
					AXX	Syst. A, T-960 pump ranges up to 2 bar/30 psi
					AHX	Syst. A, T-970 pump ranges up to 20 bar/290 psi
					BXX	Syst. B, T-965 pump ranges up to 2 bar/30 psi
					BHX	Syst. B, T-975 pump ranges up to 20 bar/290 psi
						Sample order number
HPC	400	020C	G	BC	BHX	HPC400, vacuum to 20 bar, NIST traceable certificate, rechargeable battery package, soft case, system B T-975 pump

ACCESSORIES

Rechargable battery kit - Option B
The HPC400 is available with a set of 4 rechargeable AA batteries and a charger.

Useful soft case - Option C
The HPC400 can be delivered with a soft case as option. The handy soft case is designed for protection during transport. The soft case has separate compartments for HPC400 (w/Velcro strap), test leads, test hoses, temperature probe, and JOFRA APM pressure module. A shoulder strap ensures convenient transportation when climbing ladders, etc. and the handy strap at the back makes it possible to hang the instrument on a pipe, ladder etc. The manual and calibration documents fit into a pocket on the front of the soft case.

Complete calibration systems
The HPC400 is available as a calibrator only or one of 6 ready-for-test systems that are complete and equipped to meet your pressure calibration needs.

Option C

AMETEK Calibration Instruments
is one of the world's leading manufacturers and developers of calibration instruments for temperature, pressure and process signals as well as for temperature sensors both from a commercial and a technological point of view.

JOFRA Temperature Instruments
Portable precision thermometers. Dry-block and liquid bath calibrators: 5 series, with more than 25 models and temperature ranges from -90° to 1205°C / -130° to 2200°F. All featuring speed, portability, accuracy and advanced documenting functions with JOFRACAL calibration software.

JOFRA Pressure Instruments
Convenient electronic systems ranging from -25 mbar to 1000 bar (0.4 to 15,000 psi) - multiple choices of pressure ranges, pumps and accuracies, fully temperature-compensated for problem-free and accurate field use.

JOFRA Signal Instruments
Process signal measurement and simulation for easy control loop calibration and measurement tasks - from handheld field instruments to laboratory reference level bench top instruments.

JOFRA Marine Instruments
A complete range of calibration equipment for temperature, pressure and signal, approved for marine use.

FP Temperature Sensors
A complete range of temperature sensors for industrial and marine use.

M&G Pressure Testers
Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading.

M&G Pumps
Pressure generators from small pneumatic "bicycle" style pumps to hydraulic pumps generating up to 1,000 bar (15,000 psi).

...because calibration is a matter of confidence

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